



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

\* APOLLO 14  
LM-8

REVISION B  
LM CUE  
CARDS

INDEXING DATA				T	PGM	SUBJECT	SIGNATOR	LOC
DATE	OPR	#						
12/21/70	MSC	00		R	APD	*	Wilkins	079-43A

PREPARED BY

FLIGHT DATA SECTION

FLIGHT PLANNING BRANCH

FLIGHT CREW SUPPORT DIVISION



MANNED SPACECRAFT CENTER  
HOUSTON, TEXAS

DECEMBER 21, 1970

HSI- 481235

APOLLO 14  
LM CUE CARDS  
CHANGE B  
JANUARY 19, 1971

PREPARED BY: C. E. Wilkins  
C. E. WILKINS  
BOOK MANAGER

APPROVED BY: J. W. O'Neill  
J. W. O'NEILL, CHIEF  
FLIGHT PLANNING BRANCH  
FLIGHT CREW SUPPORT DIVISION

It is requested that any organization having comments, questions, or suggestions concerning this document contact C. E. Wilkins, TRW Task 81, Building 4, room 265, telephone 483-3952.

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes should be submitted to the Apollo Flight Data File Manager, T. W. Holloway, CF62, Building 4, room 230, telephone 483-4271.

Distribution of this document is controlled by J. W. O'Neill, Chief, Flight Planning Branch, Flight Crew Support Division.

i  
 APOLLO 14  
 LM CUE CARDS

**LIST OF EFFECTIVE PAGES**

BASIC 8/8/70  
 CHANGE 8/21/70  
 REVISION A 11/9/70  
 REVISION B 12/21/70  
 PEN & INK 1/12/71 (P&I)  
 CHANGE 1/19/71  
*Pen+Ink 1/20/71*  
*Pen+Ink 1/21/71*

\* INDICATES CURRENT CHANGE

PAGE NUMBER	CHANGE DATE
*i . . . . .	1/12/71
ii . . . . .	12/21/70
iii . . . . .	11/9/70
1 . . . . .	12/21/70
2 . . . . .	12/21/70 (11/10/70)**
3 . . . . .	12/21/70 (9/15/70)**
4 thru 6 . . . . .	12/21/70
7 . . . . .	12/21/70 (12/14/70)**
8 and 9 . . . . .	12/21/70
10 . . . . .	<del>BASIC</del> 1/20/71
*11 . . . . .	1/19/71
12 thru 16 . . . . .	12/21/70
17 . . . . .	11/9/70 <i>18+19 --- 12/21/70</i>
<del>18</del> thru 23 . . . . .	12/21/70 <i>20 --- 1/21/71</i>
24 . . . . .	1/12/71 (P&I)
25 thru 27 . . . . .	12/21/70
28 . . . . .	1/12/71 (P&I)
29 thru 31 . . . . .	12/21/70

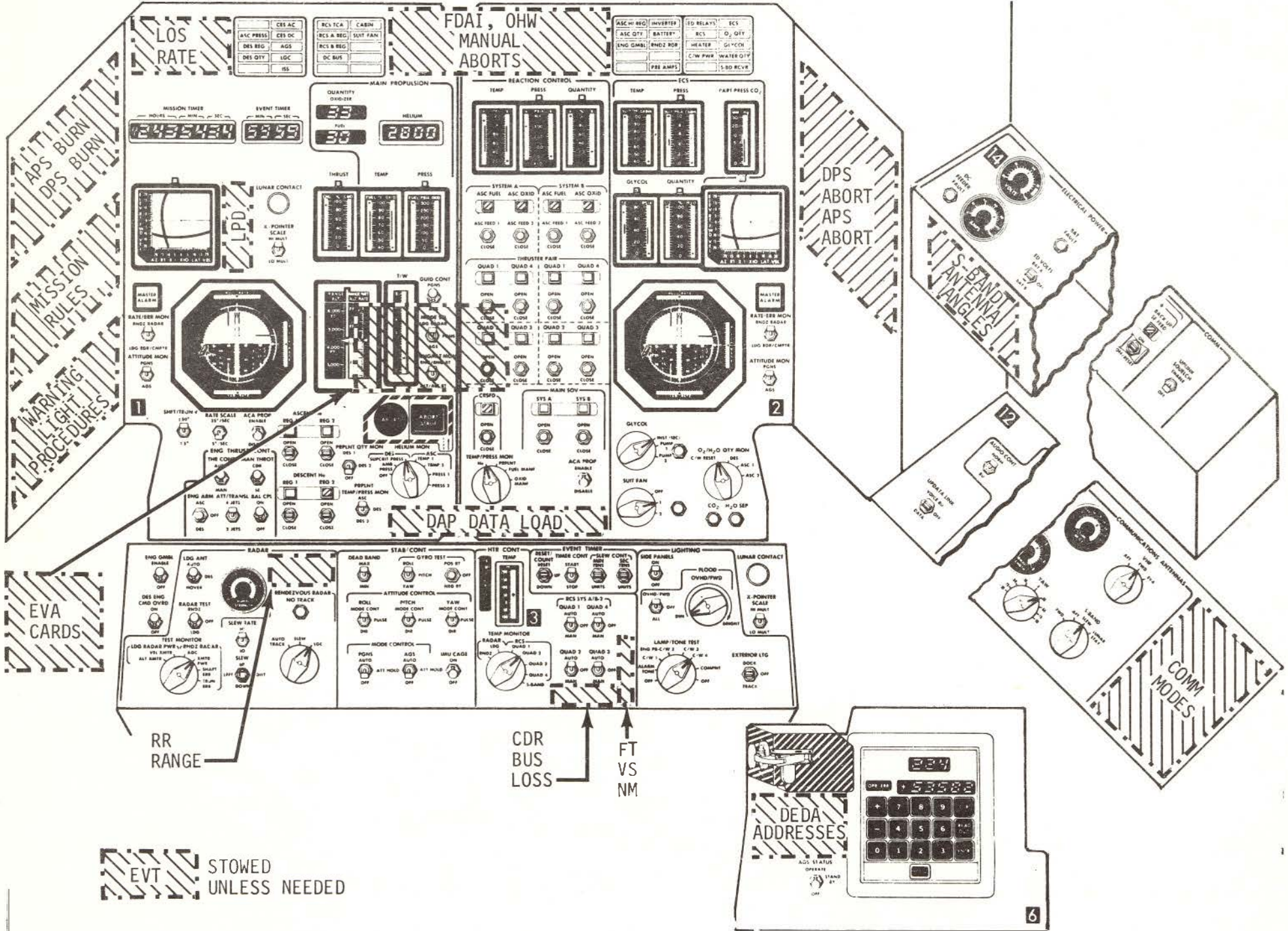
\*\*Date of MPAD Data.

CONTENTS

	PAGE
FT NM . . . . .	1
S-BAND ANTENNA ANGLES . . . . .	2
LPD CHANGES . . . . .	3
DEDA ADDRESSES . . . . .	4
RR RANGE VS AGC VOLTS . . . . .	5
COAS BORESIGHT LOG . . . . .	6
DAP DATA LOAD . . . . .	6
DPS, APS, RCS . . . . .	6
FDAI AND OHW ANGLES FOR MANUAL DESCENT ABORT . . . . .	7
CDR BUS LOSS, LMP BUS LOSS . . . . .	8
LOS RATE, RANGE, RANGE RATE VS TIME FROM TPI . . . . .	9
LM COMM MODES . . . . .	10
LOSS OF COMM (POI) . . . . .	11
LM COORDINATES/STEERABLE ANTENNA . . . . .	11
ALARM CODES (PDI) . . . . .	12
MISSION RULES NO-GO'S . . . . .	13
ABNORMAL VEHICLE DYNAMICS . . . . .	14
RAPID IMU REALIGN . . . . .	14
LIGHT/MEANING/IMMEDIATE ACTION . . . . .	14
DPS BURN . . . . .	16
APS BURN . . . . .	17
NO PDI+12 APS ABORT . . . . .	17
DPS ABORT/INSERTION . . . . .	18
APS ABORT/INSERTION . . . . .	18
ABORT RULES . . . . .	18
STAGING . . . . .	19
DPS ABORT/APS INSERTION . . . . .	19
CONTINGENCY EVT (2 OPS) . . . . .	20
EVT (DOCKED) . . . . .	21
EVT (UNDOCKED, STABLE) . . . . .	21
EVT (UNDOCKED, UNSTABLE) . . . . .	21
ONE MAN EVA . . . . .	22
EVA 1 PREP & POST . . . . .	24
EVA 2 PREP & POST . . . . .	28

11/9/70

# LM CUECARD LOCATIONS



**EVT** STOWED UNLESS NEEDED

ft	nm
500	= 0.08
1000	= 0.16
1500	= 0.25
2000	= 0.33
2500	= 0.41
3000	= 0.49
3500	= 0.57
4000	= 0.66
4500	= 0.74
5000	= 0.82
5500	= 0.90
6000	= 0.99
6500	= 1.07
7000	= 1.15
7500	= 1.23
8000	= 1.32
8500	= 1.40
9000	= 1.48
9500	= 1.56



12/21/70

8/8/70

PAGE 2

S-BAND  
 ANTENNA ANGLES  
 DESCENT REFSMMAT

11/10/70

YAW=0°		IGA (PITCH)	YAW=180°	
ANTENNA			ANTENNA	
P	Y		P	Y
121	-38	0	57	-43
108	-41	10	70	-46
95	-42	20	84	-48
82	-42	30	99	-47
69	-40	40	113	-45
57	-37	50	126	-42
46	-32	60	138	-37
36	-27	70	148	-32
27	-21	80	157	-25
19	-15	90	165	-19
12	-8	100	172	-12
5	-1	110	179	-5
-2	6	120	186	2
-10	13	130	194	9
-17	20	140	201	16
-25	27	150	209	23
-35	33	160	218	28
-45	38	170	228	34
-57	43	180	239	38
-70	46	190	252	41
276	48	200	265	42
261	47	210	278	42
247	45	220	-69	40
234	42	230	-57	37
222	37	240	-46	32
212	32	250	-36	27
203	25	260	-27	21
195	19	270	-19	15
188	12	280	-12	8
181	5	290	-5	1
174	-2	300	2	-6
167	-9	310	10	-13
159	-16	320	17	-20
151	-23	330	25	-27
142	-28	340	35	-33
132	-34	350	45	-38

HOOK  
 VELCRO

12/21/70

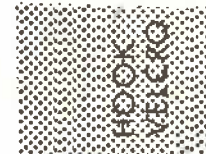
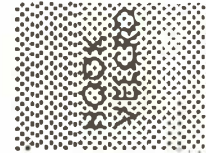
HOOK  
 VELCRO

12/21/70

LPD CHANGES

ALT	UP	DN	X
6	725	775	800
5	650	700	675
4	550	575	550
3	425	450	400
2	275	300	275
1	100	115	125
0.5	35	40	50

9/15/70



12/21/70



DEDA ADDRESSES

R DOT	- 440	Y DOT	- (Present)(-)270
R	- 317		- (Next Man)(-)263
Ha	- 315	STORE $\ddagger$	-415 & 1E
Hp	- 403	STORE R DOT	-503E
VI	- 433	STORE R	-316E
H DOT	- 367	V16N78	RR RNG/RNG RT
H	- 337	V16N92	%THROT/HDOT/H
	- 277	V21N69	$\Delta$ RLS
$\Delta$ V	404, 5,6=0	470,71,72R	

11/9/70



12/21/70

12/21/70

RR RANGE VS AGC VOLTS

RANGE	VOLTS
400 nm	1.6
200 nm	2.0
100 nm	2.2
50 nm	2.5
25 nm	2.7
12.5 nm	2.8

11/9/70

HOOK  
VELCRO

12/21/70

HOOK  
VELCRO

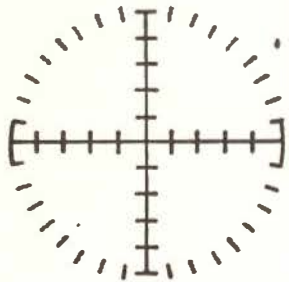
HOOK  
VELCRO

12/21/70

12/21/70

PAGE 6

COAS BORESIGHT  
LOG



DAP DATA LOAD

A 1=STAGED	2=UNSTAGED	3=DOCKED
B 0=RCS A	1=RCS B	2 OR 3=RCS A&B
C 0=FINE	1=NORM	
D 0=0.3°	1=1.0°	2 & 3=5.0°
E 0=0.2°/SEC	1=0.5/SEC	2=2.0°/SEC
		3=10.0°/SEC

12/21/70

DPS	APS	RCS
TEMP/PRESS MON >30 PSI @ PDI	TEMP PRESS MON >78 PSI OX	He >1400 PSI PRPLNT
HELIUM NOM >1000<1150 PSI PRE PDI	>114 PSI FU 50 - 90°F ΔT<60°F FOR BT<100 SEC	PRESS >100 PSI TEMP 40 - 100°F FUEL/OXID MANF
	HELIUM NOM PRESS 3125 PSI	PRESS >100 PSI ΔP <80 PSI QUAD TEMP >119°F (25 MIN TO FIRING)

HOOK  
VELCRO  
MHS 8/1  
1/8 SHIM

HOOK  
VELCRO  
MHS 8/1  
1/8 SHIM

HOOK  
VELCRO  
1/8 SHIM

12/21/70

HOOK  
VELCRO

PDI + LV	DPS/APS				APS				PDI + LV	DPS/APS (CONT)				APS (CONT)			
	FDAI		OHw		FDAI		OHw			FDAI		OHw		FDAI		OHw	
	ABORT + 0:20				ABORT + 0:20					ABORT + 0:20				ABORT + 0:20			
	→300°		→37°		→300°		→37°			→300°		→37°		→300°		→37°	
	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN		T1 →270°	T2 SHDN	T1 →α2	T2 SHDN	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN
0:30	NA	2:00	NA	2:00	NA	1:55	NA	2:00	5:30	7:10	9:55	7:10(9°)	9:40	8:20	11:05	8:25(8°)	11:00
1:00	NA	2:40	NA	2:40	NA	2:35	NA	2:40	6:00	7:40	11:00	7:35(10°)	11:05	9:10	12:00	9:20(8°)	11:55
1:30	NA	3:20	NA	3:25	NA	3:15	NA	3:25	6:30	8:10	12:10	8:05(12°)	12:10	10:05	13:00	10:15(7°)	12:50
2:00	2:40	4:15	2:40(0°)	4:20	2:40	4:20	2:30(1°)	4:10	7:00	8:45	13:05	8:35(13°)	13:05	10:50	13:40	11:05(7°)	13:40
2:30	3:15	5:05	3:15(4°)	5:05	3:20	5:15	3:10(5°)	5:10	7:30	9:20	14:00	9:10(14°)	14:00	11:35	14:25	11:50(7°)	14:25
3:00	3:50	5:55	3:50(7°)	5:55	4:00	6:10	3:55(7°)	6:10	8:00	10:00	14:55	9:40(15°)	14:50	12:15	15:15	12:25(7°)	15:10
3:30	4:30	6:45	4:25(8°)	6:40	4:40	7:00	4:40(8°)	7:05	8:30	10:35	15:45	10:05(17°)	15:35	12:45	16:00	13:00(8°)	15:55
4:00	5:10	7:35	5:05(9°)	7:35	5:35	8:05	5:30(9°)	8:05	9:00	11:10	16:20	10:25(17°)	16:35	13:00	16:35	13:20(11°)	16:35
4:30	5:50	8:15	5:45(9°)	8:15	6:30	9:05	6:25(9°)	9:00	9:30	11:45	16:55	10:50(18°)	17:05	13:20	17:10	13:35(12°)	17:10
5:00	6:30	9:00	6:25(9°)	9:00	7:20	10:00	7:25(9°)	10:00	10:00	12:20	17:30	11:25(18°)	17:45	13:40	17:40	13:55(13°)	17:40

12/14/70



4 Aborts on the APS after 10 min use the manual ascent angles.



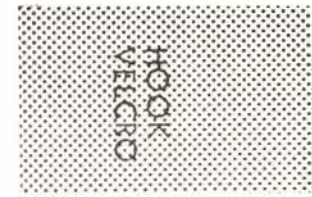
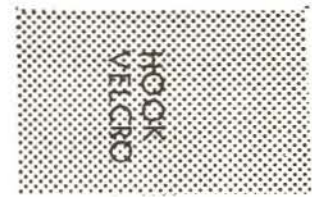
3 T1 and T2 are measured with respect to PDI.



2 Begin pitch at specified time to indicated attitude ( ).



12/21/70



CDR BUS LOST

LMP BUS LOST

12/21/70

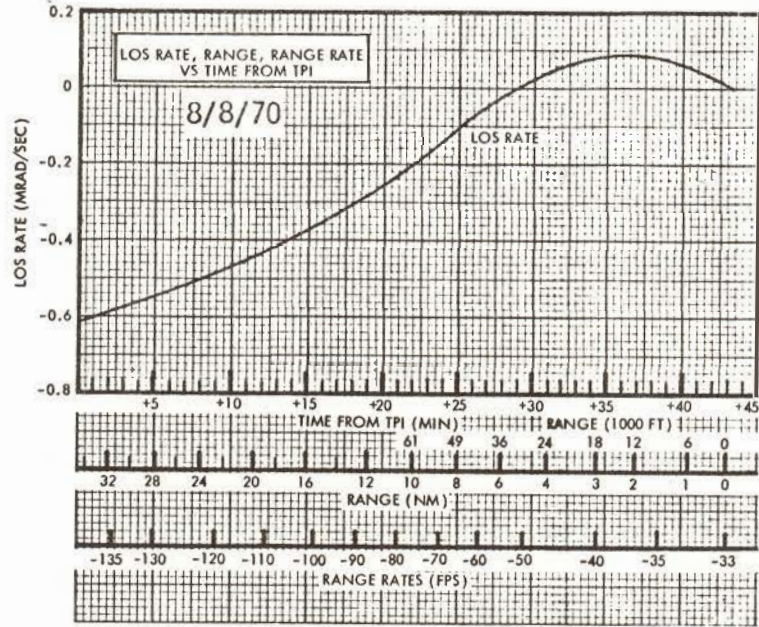
AGS  
INV 2  
SUIT FAN 2  
CDR AUDIO CONT-BU  
ACTIVATE SEC GLY LOOP  
SEE EPS 1, BLOCK 17

INV 1  
SUIT FAN 1  
LMP AUDIO CONT - BU  
S-BD SEC/SEC/DN VOICE BU/BIOMED-OFF  
S-BD ANT - OMNI  
SEE EPS 1, BLOCK 28

HOOK  
VELCRO

HOOK  
VELCRO

12/21/70



HOCK  
VR/CND

12/21/70

HOCK  
VR/CND

EM COMM MODES

1/20/71  
8/8/70

COMM BASIC CONFIGURATION	PRIOR TO DOCKING	PREP FOR UN DOCKING	LOS PRO- CEDURE	EM RELAY WITH VHF RNG	CSM RELAY	LUNA STAY	PLSS/ EVCS WITH TV (EVA)
PANEL 11-ALL COMM CB'S-CLOSED							
PANEL 8 - AUDIO (CDR)					OFF		
S-BAND T/R SW - T/R							
ICS T/R SW - T/R							
RELAY ON SW - RELAY OFF							
MODE SW - ICS/PTT				VOX			VOX
AUDIO CONT SW - NORM							
VHF A SW - T/R						OFF	OFF
VHF B SW - OFF	RCV	RCV	RCV	RCV		RCV	
VOX SENS - MAX							
PANEL 16 - ALL							
ALL COMM CB'S-CLOSED							
CB(16 TV - ) OPEN							CLOSED
PANEL 14 - UPLINK SQUELCH SW AS DESIRED	ENABLE	ENABLE	ENABLE	ENABLE	OFF	OFF*	ENABLE
PANEL 12, UPDATA LINK SW - OFF							
PANEL 12 - AUDIO (LMP)				RCV	OFF		
S-BANK T/R SW - T/R							
ICS T/R SW - T/R					ON		ON
RELAY ON SW - RELAY - OFF							
MODE SW - ICS/PTT				VOX			VOX
AUDIO CONT SW - NORM							
VHF A SW - T/R						OFF	
VHF B SW - OFF	RCV	RCV	RCV	RCV		RCV	RCV
VOX SENS - MAX INCR							
PANEL 12 - COMM							
S-BAND MODULAT SW-PM							FM
S-BANK XMTR/RCVR SW-PRIM							SEC
S-BAND PWR AMPL SW-PRIM							
S-BAND VOICE SW-VOICE			VOICE				
S-BAND PCM SW - PCM							
S-BAND RANGE SW-OFF/ ESET		RANGE				AS REQ	
VHF A XMTR SW -VOICE	V ICE/ RNG			VOICE OR VOICE/RNG (IF RNG REQ)		OFF	
VHF A RCVR SW - ON						OFF	
VHF B XMTR SW -OFF		DATA	DATA		DATA	OFF	
VHF B RCVR SW - OFF	ON	ON		ON		ON	ON
SQUELCH VHF A - NORM							N.T.*11/2
SQUELCH VHF B - NORM							N.T.*11/2
TLM BIOMED SW - AS REQ	RIGHT	RIGHT	OFF	OFF			OFF
TLM PCM SW - HI		LO	LO				
RECORDER SW - OFF	AS DES	AS DES	AS DES	AS DES	AS DES	AS DES	ON
PANEL 12 - COMM ANT:							
TRACK MODE SW - AUTO			SLEW			SLEW	OFF
PITCH CONT - COMPUTED ANGLE							
YAW CONT - COMPUTED ANGLE							
S-BAND SEL-SLEW			AFT OR FWD				AS REQ
VHF SEL - AFT OR FWD							EVA
*DURING EVA - ENABLE							

B11



LOSS OF COMM (PDI)

- 1 VERIFY STANDARD COMM CONFIG
- 2 S-BD SIG STR LOW (<3.0)-REACQ WITH STEERABLE
- 3 STILL NO COMM(SIG STR LOW<3.0) OMNI - SELECT BEST OMNI
- 4 STILL NO COMM  
S-BD: XMTR/RCVR - SEC  
: PWR/AMP - SEC
- 5 60 SEC, STILL NO COMM  
DN VOICE BU (HOT MIKE)  
BIOMED - OFF
- 6 60 SEC, STILL NO COMM  
VOICE  
FM
- 7 60 SEC, STILL NO COMM  
CSM RELAY  
PM  
S-BD AUDIO (BOTH) - OFF  
NOTIFY CSM TO CONFIG  
FOR RELAY

LM CORD	STER ANT	
	PITCH	YAW
+X	90	-45
-X		
+Y	90	45
-Y		
+Z	0	0
-Z	180	0



LOSS OF COMM (EVA)

- |   |                            |
|---|----------------------------|
| 1CK ERECT ANT ALIGNMENT                           | 6CONFIG LM TO B/U EVA MODE |
| 2CK COMM CBs                                      | XMTR A-OFF                 |
| 3SEL ALT S-BD XMTR/RCVR                           | XMTR B-VOICE               |
| 4IF SIG STR METER < 3.9,<br>SEL STEERABLE ANT     | AUDIO (CDR)                |
| 5CONFIG FOR CDR RELAY:<br>AUDIO (LMP) AUDIO (CDR) | VHF A-RCV                  |
| RELAY-OFF RELAY-ON                                | VHF B-T/R                  |
| VHF A-OFF VHF A-T/R                               | PLSS MODE-A(CDR), B(LMP)   |
| VHF B-OFF VHF B-RCV                               | 7S-BD-DN VOICE BU          |
| IF COMM OK, PLSS MODE-AR                          | 8UPDATA LINK - VOICE BU    |
|   | 9VHF ANT-AFT               |



1/19/71



## ALARM CODES (PDI)

CODES	DEFINITION	ACTION
00214	PROG USING IMU WHEN TURNED OFF	GUID CONT - AGS
00402 (4 TIMES)	FIND CDUW ROUTINE NOT CONTROLLING ATTITUDE	GUID CONT - AGS
00511	NEITHER OR BOTH LR ANT POSITION DISCRETES PRESENT	LR ANT - HOVER, CONSULT MSFN
01107	PHASE TABLE FAILURE	GUID CONT-AGS (LAND MANUALLY IF DESIRED)
RECURRING 01406	BAD RETURN FROM ROOTPSRS	NO GUIDANCE, SWITCH TO P66 OR SWITCH TO AGS
RECURRING 01410	UNINTENTIONAL OVERFLOW IN GUIDANCE	NO GUIDANCE, SWITCH TO P66 OR SWITCH TO AGS
01412	DESCENT IGN ALGORITHM NOT CONVERGING	<u>PRIOR TO BURN</u> -SUSPECT BAD UPLINK SV OR RLS, HAVE MSFN SEND NEW UPLINK
01466	INSUFFICIENT THROTTLE SERVICING	GUID CONT - AGS, FLY PGNS ATTITUDE ERROR NEEDLES
01703	INTEGRATION CANNOT BE COMPLETED IN TIME FOR BURN	<u>IF LARGE IGNITION DELAY</u> -DO NOT BURN POI <u>IF SMALL IGNITION DELAY</u> -MANUALLY THROTTLE UP AT DET N+26
2XXXX	ALL POODO'S (EXCEPT 21406)	GUID CONT - AGS
21406	BAD RETURN FROM ROOTPSRS	SUSPECT BAD UPLINK SV OR RLS, HAVE MSFN SEND NEW UPLINK
RECURRING 3XXXX	ALL SOFTWARE RESTARTS (BAILOUT)	CONTINUE-INSURE NO UNSAFE CONDITION DEVELOPS. IF IT DOES SWITCH TO AGS TO REDUCE LGC DUTY CYCLE AND FLY PGNS ATTITUDE ERROR NEEDLES
N49	RMAX VMAX >.3nm, 2.0fps	1. IF STEADY STATE-RESET 2. REJECT FIRST MARK THEN ACCEPT NEXT COUPLE OF MARKS AND MONITOR FOR NEXT CONVERGENCE >2.0nm OR 12.0fps PRIOR TO CSI OR >.8nm OR 5.0fps AFTER CSI CONSIDERED EXCESSIVE
F97N63	LGC THINKS ENG FAILED	PRO TO SET ΔV MON. DO NOT ENTER BECAUSE IT WILL SLIP TIG IF RECURRING, NO GUIDANCE

MISSION RULES NO-GO'S

PAGE 13

12/21/70

	PRE PDI	PDI TO PDI +5+30	PDI +5+30 TO HI GATE	HI GATE TO LO GATE	LO GATE TO TD
EPS	ONE DC BUS	ABORT	ABORT	ABORT	ABORT
	ONE DESCENT FEEDER SHORTED	ABORT	ABORT	ABORT	ABORT
	ONE ASCENT FEEDER SHORTED	ABORT	ABORT	ABORT	ABORT
	3 DESCENT BATS	ABORT	ABORT	ABORT	GO
	ONE ASCENT BAT	ABORT	ABORT	GO	GO
	BOTH INVERTERS	ABORT	ABORT	ABORT	GO
	AC BUS A AND B	ABORT	ABORT	ABORT	GO
ED	ONE PYRO SYSTEM ARMED	ABORT	ABORT	ABORT	ABORT
	ONE PYRO SYSTEM	ABORT	ABORT	ABORT	ABORT
ECS	CABIN PRESS <4.4	ABORT	ABORT	ABORT	GO
	SUIT LEAK	ABORT	ABORT	ABORT	ABORT
	BOTH SUIT FANS	ABORT	ABORT	ABORT	GO
	BOTH DEMAND REGS	GO	GO	GO	GO
	BOTH H2O SEPS	GO	GO	GO	GO
	DESCENT O2 TANK	GO	GO	GO	GO
	TWO O2 TANKS	ABORT	ABORT	ABORT	GO
	PRI OR SEC COOLANT LOOP	GO	GO	GO	GO
	PRI AND SEC COOLANT LOOP	ABORT	ABORT	ABORT	GO
	PRI OR SEC H2O FEED	GO	GO	GO	GO
	PRI AND SEC H2O FEED	ABORT	ABORT	ABORT	GO
	DESCENT H2O TANK	GO	GO	GO	GO
	TWO H2O TANKS	ABORT	ABORT	ABORT	GO
G&C	PGNS GUID STEER	ABORT	ABORT	GO	GO
	3 AXIS ATT CONT ACA				
	PGNS RATE CMC & PGNS AUTO	ABORT	ABORT	OPTION	OPTION
	AGS RATE CMD	ABORT	ABORT	OPTION	OPTION
	2 ACA	ABORT	ABORT	ABORT	ABORT
	AUTO +X & AUTO DPS IGNITION	GO	GO	GO	GO
	2 FDAI-ATT/RATE/ERR	OPTION	OPTION	OPTION	OPTION
	LR	ABORT	ABORT	GO	GO
	RED APS ON	ABORT	GO	GO	GO
	P & R GDA TRIM (IMPING CONST VIOL)	ABORT	ABORT	ABORT	ABORT
	MANUAL THROTTLE (2 TTCA) & AUTO THROT	ABORT	ABORT	ABORT	ABORT
DPS	PROP LEAK ( $\Delta Q$ FU/OX>13%)	ABORT	ABORT	ABORT	ABORT
	FU OR OX INLET/ULLAGE>65%<160	ABORT	ABORT	ABORT	ABORT
	LO LEVEL <2%			ABORT	ABORT
APS	PROP LEAK	ABORT	ABORT	ABORT	ABORT
	FU/OX INLET PRESS<62,>220	ABORT	ABORT	ABORT	ABORT
	APS HE 1 OR 2 DECREASING	ABORT	ABORT	ABORT	ABORT
RCS	HE/PROP LEAK				
	HE/PROP LEAK (BETWEEN MAIN & ISO VLV)	ABORT	ABORT	GO	GO
	FU/OX MNFLD A OR B PRESS<100	ABORT	ABORT	ABORT	ABORT
	PAIR ISOLATED	GO	GO	GO	GO
	3 AXIS ATT CONT RED	GO	GO	GO	GO
3 AXIS ATT CONT	ABORT	ABORT	ABORT	ABORT	

ABNORMAL VEHICLE DYNAMICS

Use ACA Hardover to Stabilize Vehicle  
 If RCS TCA LT ON-Affected QUAD-CLOSE  
 GUID CONT-AGS, MODE CONT-ATT HOLD, ATT CONT(3)-MODE CONT, V77E  
 If Not Stabilized-CB(11) STAB/CONT:ATT DIR CONT-OPEN  
 If Not Stabilized-TTCA/TRANSL(2)-DISABLE, DEADBAND-MAX  
 If Not Stabilized-ACA PROP(2)-DISABLE

RAPID IMU REALIGN

- 1) AGS INERTIAL FDAI TO 0°, 0°, 0°
  - 2) V41 N20E, E, E, E,
  - 3) V40 N20 0°, 0°, 0° ON AGS FDAI, ENTR  
WAIT 15 SEC.
  - 4) P51E, PRO, POOE
  - 5) V25N07E, 77E, 10000E, 1E
  - 6) PERFORM P52, OPTION 3 (AUTO OPTICS ARE GOOD)
- NOTE: FOR TEMPORARY LOSS OF CDR'S BUS, UPDATE  
LGC CLOCK WITH V55 TO COMPLETE RECOVERY.

LIGHT	MEANING	IMMEDIATE ACTION (POSSIBLE OPERATIONAL IMPLICATIONS)
DC BUS BATTERY FEEDER FAULT COMPONENT ~7 W&C LTS	CDR BUS FAILURE	(DPS GOES TO 100%) GUIDE CONT - AGS, SUIT FAN - 2, CDR AUDIO CONT - BU, INV 2, Activate Sec Glycol Loop TO START DPS: DES ENG CMD OVRD - ON TO STOP DPS: DES ENG CMD OVRD - OFF, ENG STOP - PUSH, ENG ARM - OFF TO START APS: AGS Auto ON TO STOP APS: AGS Auto OFF, ABORT STAGE - Reset UNSTAGED (M45) STAGED (M47)
DC BUS BATTERY FEEDER FAULT COMPONENT ~7 W&C LTS	LMP BUS FAILURE	(DPS GOES TO 100% And GDA LOCKED) GUIDE CONT - PGNS, SUIT FAN - 1, LMP AUDIO CONT - BU, INV - 1 TO START APS/DPS: ENG START - PUSH TO STOP APS/DPS: ENG STOP - PUSH UNSTAGED (M45) STAGED (M47)
BATTERY	BATT OVERTEMP REV CURRENT >10A OVERCURRENT	UNSTAGED: Check All BATS VOLTS, AMPS & TB'S If VOLTS, AMPS OK: Faulty BAT - OFF Then ON If VOLTS, AMPS NOT OK: Faulty BAT - OFF, CB (11&16) CROSS TIE BAL LOADS - CLOSE (M48) STAGED: Check BAT 5, 6 VOLTS, AMPS & TB'S If VOLTS, AMPS NOT OK: CB (11&16) CROSS TIE BUS - CLOSE Faulty BAT: NORMAL FEED - OFF, Good BAT: BACKUP FEED - ON (M48)
INVERTER	AC VOLTS <112 398>FREQ>402	Check AC VOLTS & FREQ. Switch to INV - 2. Bus A&B BUS TIE INV 1 (2) - OPEN (INV 1 Feeder Short). BUS B: BUS TIE INV 2 - OPEN (BUS B Short) BUS A&B: BUS TIE INV 1 (2) - CLOSE. Select INV 1. BUS A: BUS TIE INV 2 - OPEN (INV 2 Feeder Short). BUS A: BUS TIE INV 1 - OPEN (BUS A Short, Lt Stays ON; Close BUS B: BUS TIE INV 2 Before Selecting INV 2). (M49)
ED RELAY	ED Relays K1 To K6 CLOSE With MASTER ARM - OFF	BEFORE PDI: Do NOT Set MASTER ARM-ON, STAGE RELAY - RESET, Appropriate LOGIC POWER CB - OPEN AFTER PDI: Do NOT Set MASTER ARM - ON, STAGE RELAY - RESET If STAGE SEQ RELAYS LT Still ON: ASC He PRESS - FIRE, Monitor ASC Fuel/Oxid Press. If APS Pressurizes. ABORT (M71)

LIGHT	MEANING	IMMEDIATED ACTION (POSSIBLE OPERATIONAL IMPLICATIONS)
STAGE SEQ RELAY LT. OFF AT PDI	Possible Relay Fail	AT PDI: MASTER ARM - OFF, Open LOGIC PWR CB On System Which Had SEQ LT - ON, MASTER ARM - ON. At Ignition Monitor DPS SHe And FUEL/OXID PRESS. SHe Tank Inoperative: STOP PB - PUSH, ENG ARM - OFF. SHe Tank OK: MASTER ARM - OFF, LOGIC PWR CB - CLOSE (M71)
DES REG	220 psi>He Press>260psi	DES He REG 1 - CLOSE, DES He REG 2 - OPEN Monitor TEMP/PRESS, Maintain FUEL & OXID>160psi (M31)
ASC PRESS	Either He Press<2775psi (Before Staging)	<u>IF APS NOT PRESSURIZED</u> - CONSULT MSFN, GO TO MAL PROC APS-1 <u>IF APS PRESSURIZED</u> - CLOSE ASC He REG 1 & 2: MONITOR ASC He PRESS; IF BOTH <2775 AND DECREASING - <u>IMMEDIATE LIFTOFF</u> MONITOR FUEL/OXID PRESS; IF EITHER DECREASING - <u>IMMEDIATE LIFTOFF</u> (M37)
ASC HI REG	Manf Press>220psi	ASC He REG 1 & 2 CLOSE, When <220psi, Open Each REG Separately. (M38)
ASC QTY	<10 Sec Burn Time	MAIN SOV (2) - OPEN, ASC FEED 2 (2) - CLOSE (M38)
RCS A REG RCS B REG	165psi>Reg Press>218psi	Monitor MANF PRESS, When <100psi: Bad System MAIN SOV - CLOSE, CRSFD - OPEN (M42)
RCS	A OR B He Press<1770	Monitor He PRESS & RCS QUANTITY. Affected Sys: QUAD ISOL (4) - CLOSE, MAIN SOV - CLOSE. Monitor MANF PRESS. (Translation May Be Lost In One Or More Axis With A Single System Out.) (M41)
RCS TCA	One Or More Thrusters Fail Off, Collinear Thrusters Firing Simultaneously	If Stable, Recycle CWEA. If Unstable: Affected QUAD ISOL - CLOSE, Monitor MANF PRESS. Between Ullage And Throttle-up Wait 2 Sec, Affected QUAD ISOL - CLOSE (M42)
ENG GMBL	GMBL Cmd/Response Discrepancy	ENGN GMBL - OFF. If Lt Still ON: ENG GMBL - ENABLE (CWEA FAIL) (M25)
LGC	LGC Power, Scaler, or Counter Fail	GUID CONT - AGS. Poss No Auto Eng Shutdown. <u>If RESTART Lt ON</u> , LGC Fail. CB(11)AEA - CLOSE (M10)
ISS	IMU, ICDU or PIPA (Trusting) FAIL	GUID CONT - AGS. Poss No Auto Eng Shutdown. <u>IF PROG Lt NOT ON</u> , CWEA Fail. CB(11) AEA - CLOSE (M9)
CES AC	ATCA AC Out of Tolerance	GUID CONT - PGNS, GYRO TEST - POS RT. <u>If Light Stays ON</u> , CWEA Fail. Poss Loss of AGS Control, FDAI Rate Needles Unreliable, RR Usable In LGD Mode Only. (M27)
CES DC	ATCA DC Out of Tolerance	GUID CONT - PGNS, GYRO TEST - POS RT. <u>If Lt Stays ON</u> , CWEA Fail, If Lt OFF - Cycle CWEA CB, If Lt Stays OFF, Cycle DECA GMBL AC CB To Unlock Throttle. If Lt Reappears: Poss GDA Lock-up, DPS To 100%, No AGS Attitude Control (M27)
AGS	AGS Power Supply Out of Tolerance, AGS Heater Failed ON, AGS Self Test Failed	GUID CONT - PGNS. If PGNS Unavailable: MODE CONT (AGS) - ATT HOLD, AGS RATE CMD OK, But NO ATT HOLD (Free Drift). 412R, Self Test. (M17)

DPS BURN

12/21/70

CB(11) DECA GMBL AC - CLOSED  
CB(16) DISP/ENG OVRD/LOGIC - CLOSED  
CB(11)&(16) STAB/CONT CB'S(ALL) - CLOSED  
EXCEPT CB(11) AEA - OPEN

RATE SCALE  PDI - 25°/SEC

THR CONT - MAN/CDR  
-  PDI AUTO/CDR

ATT/TRANSL - 4 JETS  
BAL CPL - ON  
ENG GMBL - ENABLE  
DES ENG CMD OVRD - OFF  
ABORT/ABORT STAGE - RESET  
DEADBAND - MIN  
ATT CONT(3) - MODE CONT

MODE CONT  PDI PGNS - AUTO  
AGS - AUTO

STOP PB (2) - RESET  
TTCA (2) - THROT/fin  PDI LMP TTCA-SOFT STOP

FOR PDI GO TO TIMELINE BOOK

-2:00 400+1

-1:00 MASTER ARM - ON (1st BURN)

- :30 ENG ARM - DES

FOR AGS BURN ABORT PB - PUSH (T=0 FOR AGS)

-:07.5 ULLAGE (MANUAL FOR AGS)

- :05 PRO

+ :01 DES REG (2)-OPEN (>29%)

TFC-10 DES REG (2) - CLOSE (<86%)

ΔV=0 STOP PB - PUSH

ENG ARM - OFF

ABORT PB - RESET

NO PDI+12 APS ABORT

## ASSUMPTIONS:

PDI CHECKLIST COMPLETE TO TIG.  
DPS INOPERATIVE.

V37E 30E, LOAD NO PDI+12 PAD  
V37E 42E

01706 ALARM, PRO  
N86  
410+5, LOAD ΔV  
267 R  
411+1  
407+0

N18 R, P, Y (0, 270, 0)

## SET DET

He MON - ASC PRESS  
MASTER ARM - ON  
ASC He SEL - BOTH  
CB(11)&(16)  
✓ED LOGIC PWR(2)-CLOSED  
He PRESS ASC - FIRE

DES 02 - CLOSE  
#1 ASC 02 - OPEN  
H20 SEL - ASC  
DES H20 - CLOSE  
ASC H20 - OPEN

V48, 11002

CHECK APS BURN

APS BURN

CB(16)

DISP/ENG OVRD/LOGIC - CLOSED

CB(11)&(16)

STAB/CONT (ALL) - CLOSED

EXCEPT

CB(11) AEA AND DECA PWR AND

CB(16) DES ENG OVRD - OPEN

CB(16) EPS:

CROSS TIE BAL LOADS - OPEN

RATE SCALE - 25°/SEC

ATT/TRANSL - 4 JETS

BAL CPL - ON

DEAD BAND - MIN

ABORT/ABORT STAGE - RESET

ATT CONT(3) - MODE CONT

MODE CONT - ASCENT - PGNS - AUTO

AGS - AUTO

STOP PB (2) - RESET

TTCA (2) - JETS

411+1

-2:00 400+1

AGS/PGNS

-1:00 MASTER ARM - ON

RCS STAGE

-:14 MANUAL ULLAGE

-:10 STAGE-FIRE

-:10 ABORT STAGE PB - PUSH(T=0 FOR AGS)

ENG ARM - ASC

-:05 PRO

:00 ENG ON

+:01 ENG START - PUSH

200 fps ENG ARM - OFF

0 fps ABORT STAGE - RESET

STOP PB - PUSH

DPS ABORT/INSERTION

APS ABORT/INSERTION

✓GUID SW  
 THROTTLE-UP  
 ABORT PB- PUSH  
 MODE CONT(BOTH)-AUTO  
 YAW RT 30°  
 623+1  
 ✓INVERTER  
 V16N85 (500R)  
 29% DES REG-CLOSE  
 200fps DES ENG CMD OVRD-OFF  
 (UNLESS CDR BUS OUT)  
 TFC-10 DES REG-Close (<86%)  
 STANDBY TO COPY GET  
 0fps STOP PB - PUSH  
 DET - STOP  
 GET \_\_\_\_\_  
 MODE CONT-ATT HOLD  
 ENG ARM-OFF  
 ABORT (STAGE)-RESET  
 STOP PB - RESET  
 404,5,6=0 470R

✓GUID SW  
 ABORT STAGE PB-PUSH  
 MODE CONT(BOTH)-AUTO  
 ENG ARM-ASC  
 START PB-PUSH  
 ASC FEED(2)-OPEN+ (UNLESS  
 MAIN SOV-CLOSE+ BUS LOSS)  
 YAW RT 30°  
 623+1  
 CABIN REPRESS - CLOSE  
 DES O2-CLOSE, #1 ASC O2-OPEN  
 PRESS REGS A&B - EGRESS  
 SUIT GAS DIV - EGRESS  
 CABIN GAS RETURN - EGRESS  
 H2O SEL-ASC  
 DES H2O-CLOSE, ASC H2O - OPEN  
 PROP TEMP/PRESS-ASC  
 He MON-ASC  
 ✓XFEED  
 ✓INVERTERS  
 THROTTLE/JETS-JETS  
 V16N85 (500R)  
 MAIN SOV-OPEN+  
 ASC FEED(2)-CLOSE+  
 500fps ENG ARM-OFF (UNLESS BUS LOSS)  
 200fps STANDBY TO COPY GET  
 0fps ABORT STAGE-RESET  
 STOP PB-PUSH  
 DET-STOP  
 GET \_\_\_\_\_  
 MODE CONT-ATT HOLD  
 404,5,6=0 470R

ABORT RULES

- 1 ATT & RATE LIMITS  
DPS >5° SEC  
APS >10° SEC
- 2 DPS SHUTDOWN  
<30 fps - STAGE & RCS  
>30 fps - ABORT STAGE
- 3 APS UNDER BURN

PGNS	AGS
<400 NULL RESIDUALS	AUTO,
>400 A/H BURN Ha, Hp, HDOT	A/H 15FPS

- 4 INSERTION  
WITH VOICE-GROUND RECOMMENDS TRIM SOURCE AT T GO~1 MIN  
TRIM TO <2fps (AGS X AXIS ONLY) AND STANDBY FOR  
TWEAK AT INSERTION +4 MINUTES(10° OHW OR 250° FOAI)
- 5 NO VOICE  
AGS & PGNS <10fps TRIM ACTIVE SYSTEM  
AGS & PGNS >10fps TRIM SYSTEM THAT AGREES WITH RR

12/21/70

STAGING

ASC BATT (2)-ON(PRECONDITION)  
 DES BATTs-OFF  
 MODE CONTROL (BOTH)-ATT HOLD  
 DEADFACE  
 ✓GUID SW (IF PGNS: DAP 11002, V77)  
 ATT CONT (3)-MODE CONT  
 BAL CPL-ON  
 DEAD BAND - MIN  
 P47, 404,5,6=0  
 470R  
 HELIUM MON-✓ASC PRESS  
 MASTER ARM-ON  
 ASC He Sel-BOTH  
 ✓CB ED LOGIC PWR (2)-CLOSED  
 He PRESS ASC-FIRE  
 STOP PB-PUSH  
 -X TRANS 2fps  
 STAGE-FIRE  
 +X TRANS 2fps  
 CB ED LOGIC PWR (2)-OPEN  
 CABIN REPRESS-CLOSE  
 DES O2-CLOSE, #1 ASC O2-OPEN  
 H2O SEL-ASC  
 DES H2O-CLOSE, ASC-H2O-OPEN  
 PRESS REG A&B-EGRESS  
 SUIT GAS DIV-EGRESS  
 CABIN GAS RETURN - EGRESS  
 ATT/TRANSL-2 JET  
 POO  
 STOP PB-RESET  
  
 ✓GUID SW

DPS ABORT/APS INSERTION

✓GUID SW  
 THROTTLE-UP  
 ABORT PB-PUSH  
 MODE CONT (BOTH)-AUTO  
 YAW RT 30°  
 623+1  
 29% DES REG-CLOSE  
 BURN DPS TO DEPLETION  
 ABORT STAGE PB-PUSH  
 ENG ARM-ASC  
 START PB-PUSH  
 ASC FEED(2)-OPEN+ (UNLESS  
 MAIN SOV-CLOSE+ BUS LOSS)  
 CABIN REPRESS - CLOSE  
 DES O2-CLOSE, #1 ASC O2-OPEN  
 H2O SEL-ASC  
 DES H2O-CLOSE ASC H2O-OPEN  
 PRESS REGS A&B-EGRESS  
 SUIT GAS DIVERTER - EGRESS  
 CABIN GAS RETURN - EGRESS  
 PROP TEMP/PRESS-ASC  
 He MON-ASC  
 ✓XFEED  
 ✓INVERTER  
 THROTTLE/JET-JETS  
 CB(11) RR(2) - CLOSED  
 V16N85 (500R)  
 500fps MAIN SOV-OPEN+  
 ASC FEED(2)-CLOSE+  
 200fps ENG ARM-OFF (UNLESS BUS LOSS)  
 STANDBY TO COPY GET  
 0fps ABORT STAGE-RESET  
 STOP PB-PUSH  
 DET-STOP  
 GET \_\_\_\_\_  
 MODE CONT-ATT HOLD  
 404,5,6=0 470R



PREP FOR EGRESS

Configure CB's As Required  
 Doff IV Gloves, Stow Under Netting  
 Behind LMP  
 Doff Helmets, Verify Feedport Cover  
 Installed, & Stow Helmets On Ceiling  
 Verify Wristwatch Donned  
 FWD Hatch Handle - UNLOCK  
 Verify With CMP That Tunnel Is Depressed

Verify - PGA Zipper Locked  
 Stow COAS On Fwd Window Mount  
 Stow DEDA & DSKY Desk, Loose Items  
 Unstow CSRC (ISA, Top Pkt) Put in  
 PGA Pkt  
 Stow Other Items As Desired For XFER  
 SEQ MAGS (6-RHSSC, 1-CAM, 1-ISA)  
 70mm MAGS (3-RHSSC 2nd Shelf,  
 1-CAM-RHSSC, 1-ISA)  
 CSC CASSETTE MAG-ISA  
 PPK-RHSSC, LHSSC  
 TOOL B IF REQ'D

Stow PGA Gas Connector Plugs In RHSSC  
 (Fecal Emesis)  
 Unstow OPS Straps & Purge Valves  
 From RHSSC (Fecal Emesis)  
 Purge Vlvs - Hi  
 Don Purge Valves (R/R) (LH Side)  
 Don OPS Straps (Break Stitches 2 Places,  
 Remove Keeper, Extend To Max Length,  
 Route Thru PGA LH D-RING With  
 Adjustable Strap On RH Side)

OPS DONNING (LMP 1st)

Unstow OPS & Checkout  
 Verify OPS Reg Decays To 2.5 PSI (~3 Min)  
 Unstow OPS O2 Gas Hose  
 Secure OPS To OPS Straps (Route  
 Under LM Hoses, Do Not Twist Strap)  
 Connect O2 Hose To PGA (B/B)  
 Fix OPS Flaps To Expose Press Gage  
 CDR Repeat OPS DONNING

CONTINGENCY EVT (2 OPS)

CB(11) ECS: CABIN FAN - OPEN (VERIFY)

CDR Unstow Lifeline/Tethers - LHSSC  
 Attach Waist Tether Hooks To PGA  
 (Connect To LMP RH Side, Route In  
 Front of LMP & Behind CDR & Connect  
 To CDR LH Side, Verify Hooks Locked)  
 Verify LM O2 Hoses - R/R, B/B

PGA Diverter Valves - Vertical  
 Don Helmets  
 Don LEVA's, Verify Helmet Aligned

Secure Transfer Items  
 CK Conn - Hel, O2, Comm, Purge Vlvs  
 Verify LM Restraints Removed  
 Don EV Gloves, Verify Locked

SUIT INTEGRITY CHECK

SUIT GAS DIVERTER - PULL-EGRESS  
 CABIN GAS RETURN - EGRESS  
 SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS  
 PRESS REG B - DIRECT O2  
 Monitor CUFF GAGE 3.7-4.0 PSIG Then  
 PRESS REG B - EGRESS (Cuff Gage  
 Decay <.3 Psig in 1 Min)  
 Verify Purge Valves Accessible

SUIT CIRCUIT RELIEF - AUTO (SUIT CKT  
 PRESS DECAYS TO 4.8 PSIA)  
 Confirm CSM Side Hatch Open And  
 CMP Go For LM Depress

LCG - COLD, As REQ'D  
 CB(16) ECS: LCG Pump - Open  
 Disconnect LM H2O Hoses  
 Inspect LMP

CABIN DEPRESS

CB(16) ECS: CABIN REPRESS-OPEN  
 CABIN REPRESS VLV - CLOSE (VERIFY)  
 Fwd Dump Valve - OPEN Then AUTO  
 At 3.5 Psia  
 Verify LM Suit Press 3.6-4.3 Psia  
 And Decaying Slowly  
 Fwd Dump Valve - OPEN  
 Monitor Cabin Press To 0 Psia  
 Verify LM Suit Press 3.6-4.3 Psia

HATCH OPENING

Open Hatch  
 LMP Verify XFER Items Ready

VERIFY/PERFORM:

CB(11) STAB/CONT: ATCA (PGNS) - OPEN  
 AELD - OPEN  
 ATT DIR CONT- OPEN  
 CB(16) STAB/CONT: ATCA (AGS) - OPEN  
 AELD - OPEN

Turn Card Over And Review Transfer  
 Method

EVT (DOCKED)

EVT (UNDOCKED, STABLE)

EVT (UNDOCKED), UNSTABLE

CDR Egress Feet First and Transfer To CSM, LMP Tend Lifeline

CDR Ingress CSM Head First, Face Toward MDC, and Move To LEB  
Retrieve C O2 Hoses and Comm Umbilical

CMP Connect C Comm Umbilical To CDR

CDR Configure Audio Panel As Desired

CDR Secure Position In LEB & Tend Lifeline For LMP

LMP Egress Feet First and Transfer to CSM

LMP Ingress CSM Feet First, Face Toward MDC, and Assume Position In Center Couch Area

CDR Connect R Electrical Umbilical to LMP

CMP Close Hatch

CSM Maneuver Apex to LM Forward Hatch

CDR, Then LMP, Egress Feet First, Move Along Handrails to CSM  
LMP Tend Lifeline

CDR Ingress CSM, Head First, Face Toward MDC, And Move To LEB  
Retrieve C O2 Hoses And Comm Umbilical

CMP Connect C Comm Umbilical To CDR

CDR Configure Audio Panel As Desired  
Secure Position In LEB And Tend Lifeline For LMP

LMP Ingress CSM Feet First, Face Toward MDC, and Assume Position In Center Couch Area

CDR Connect R Electrical Umbilical To LMP

CMP Close Hatch

\*\*\*\*\*  
LEVA - Lower As Required

OPS O2 - On

SUIT ISOL VALVES (Both) - SUIT DISC

Purge Valves - OPEN (Give Mark To CMP For T+25 Min On OPS)

Verify O2 Flow & PGA Press 3.4-4.0 Psig

Disconnect LM O2 Hoses

Disconnect LM Comm Umbilical  
Stow LM Hoses

CDR Transfer To CSM LEB (LMP Manage Lifeline)

LMP Transfer To CSM Center Couch Area (CDR Manage Lifeline)

\*\*\*\*\*

CSM Maneuver to LM

CDR Egress Feet First, Move to EVA Handrail Clear of Hatch  
LMP Tend Lifeline

LMP Egress, Move Up EVA Handrail

CDR and LMP Push Away from LM at Same Time (Give Signal, Pull In, Push Off)

CSM Maneuver Apex to CDR and LMP

CDR and LMP Use CSM Handholds to Move To Side Hatch

CDR Ingress CSM, Head First, Face Toward MDC, And Move To LEB

Retrieve C O2 Hoses And Comm Umbilical

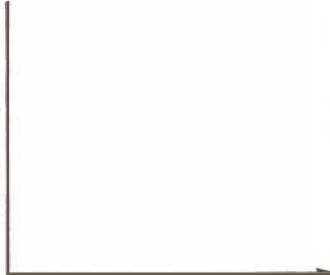
CMP Connect C Comm Umbilical To CDR

CDR Configure Audio Panel As Desired  
Secure Position in LEB And Tend Lifeline For LMP

LMP Ingress CSM Feet First, Face Toward MDC, and Assume Position In Center Couch Area

CDR Connect R Electrical Umbilical To LMP

CMP Close Hatch



CABIN PREP-Perform EVA 1 Or 2 As Req'd

EQPT PREP-Perform EVA 1 Or 2 As Req'd

PLSS DONNING-Perform EVA 1 or 2 As Req'd

Position Post EVA 1 or 2 Cue Card  
For Post EVA

NON EVA CREWMAN-Connected To LM 02,  
Comm, & H2O

Gas Connector Plugs In PGA  
PGA Diverter Vlvs - Horizontal

EVA CREWMAN: PGA Diverter Vlvs -  
Vertical  
For EVA 1 (MIN TIME) - CSRC  
In PGA Pocket

PLSS COMM CHECK

Verify Powerdown CB Configuration

Verify LM EVA Antenna Deployed

COMM: MODULATE-FM

CB(16) COMM: TV-Close

Verify Voice Comm With Hou

Audio (Non EVA Crewman)

S-BAND - T/R

ICS - T/R

RELAY - OFF

MODE - VOX (VOX SENS MAX)

VHF A - RCV

VHF B - T/R

Audio (EVA Crewman)

S-BAND - T/R

ICS - T/R

RELAY - ON

MODE - VOX (VOX SENS MAX)

VHF A - RCV

VHF B - T/R

ONE MAN EVA

COMM:

VHF-OFF, ON, VOICE, ON, NON EVA

CREWMAN POSITION, HI

SQUELCH A & B - Noise Thres + 1-1/2

RECORDER - ON

VHF Antenna - EVA

EVA Crewman Connect to PLSS Comm  
(Audio CB Open/Close)

RCU PTT - MAIN (Rt)

PLSS Mode-B, Blade-CCW (Tone-On, Vent  
Flag-P, Press Flag-0, 02 Mom)

PLSS 02 Press Gage >85%

Perform Comm Check With CDR

**NOTE:** Unstow PLSS Antenna If It Transmits  
Garbled And/Or Loses TM.

Audio (CDR & LMP)

VHF A - T/R

VHF B - RCV

COMM:

VHF A XMTR - VOICE

VHF B XMTR - OFF

PLSS Mode - A, Wheel-CCW (Tone-On)  
Perform Comm Check With Each Other &  
Comm & TM Check With Hou

Read PLSS 02 Qty To Hou

**NOTE:** IF Comm Is NO GO With Hou  
S-BD MOD - PM  
Verify Comm & TM

CB(16) COMM: TV - Open (EVA 1)

FINAL SYSTEMS PREP

CB(16) ECS: CABIN REPRESS - Close (Ver)  
SUIT FLOW CONT- Open

SUIT GAS DIVERTER - PULL-EGRESS  
CABIN GAS RETURN - EGRESS  
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT

Unstow OPS 02 Actuator  
Connect Actuator To RCU  
SUIT ISOL - SUIT DISC  
Discon LM 02 Hoses, Secure About PGA

Connect OPS 02 Hose To PGA B/B  
Retrieve Purge Valve (Purse) -  
Verify Closed, Locked & LO  
Install Purge Valve In PGA R/R

FOR EVA 2:

Verify Items Prepared For Jettison -  
ECS LiOH Cartridge & Brkt  
Hammocks  
PLSS Batteries & LiOH Carts  
Food Waste, Urine Bags  
Feedwater Bags & Scale

Drink

DES H2O VLV - CLOSE

HELMET/GLOVE DONNING

Position Mikes (Both)  
PLSS FAN - ON, Rt (Vent Flag - Clear)  
Don Helmets, Check Drink Bag Position  
Don LEVA

EVA Crewman:

LCG - COLD, As Req'd

Disconnect LM H2O Hose

Connect PLSS H2O Hose

Stow LM Hoses

Verify EVA Crewman in CDR's Station

Verify The Following:

Helmet & Visor (2) - Aligned & Adjusted  
 Torso Tiedown (2) - Adjusted  
 O2 Connectors (7) - Locked  
 Purge Valve (1) - Locked  
 H2O Connectbrs (2) - Locked  
 Comm Connectors (2) - Locked

Verify No Fog RH Window

If BSLSS Not Req'd, Stow In Jett Bag  
 Tie Jett Bag & Transfer To Eng Cover

Don EV Gloves & Verify:

Wrist Locks (4) - Locked  
 Glove Straps (4) - Adjusted

**NOTE:** If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)  
 PLSS PUMP - ON

PRESSURE INTEGRITY CHECK

(Non EVA Crewman)

**NOTE:** LM Suit Circuit Shall Not Be  
 Maintained At Elevated Press >5 min

SUIT GAS DIVERTER - PULL-EGRESS (Verify)  
 CABIN GAS RETURN - EGRESS (Verify)  
 SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS  
 PRESS REG B - DIRECT O2  
 Monitor Cuff Gage To 3.7 - 4.0 Psig  
 Then PRESS REG B - EGRESS (Cuff Gage  
 Decay <.3 Psig In 1 min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt  
 Press Decays To 4.8 Psia)

PLSS/OPS/PGA (EVA Crewman)

PLSS O2 - ON (Tone-On, O2 Flag-0)  
 Press Flag Clear (3.1-3.4 Psid)  
 Cuff Gage 3.7-4.0 Psig  
 O2 Flag Clear

PLSS O2 - OFF (Cuff Gage Decay <.3  
 Psig In 1 Min)  
 PLSS O2 - ON (Cuff Gage 3.7-4.0  
 Psig, Tone & O2 Flag May Come On)

CABIN DEPRESS

Confirm Go For Depress From Hou  
 CB(16)ECS: CABIN REPRESS - Open  
 CABIN REPRESS VLV - Close

Ovhd Or Fwd Dump Valve - OPEN Then AUTO  
 At 3.5 Psia (Verify EVA Crewman Cuff  
 Gage Does Not Drop Below 4.8 Psig)

Verify:  
 Cabin At 3.5 Psia  
 LM Suit Circuit 3.6 to 4.3 Psia &  
 Decaying  
 PLSS/OPS/PGA > 4.8 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN  
 Verify:  
 Tone-On & H2O Flag - A (1.3-1.6 Psia)  
 LM Suit Circuit 3.6 To 4.3 Psia &  
 Decaying  
 PLSS/OPS/PGA > 4.8 Psig & Decaying

Partially Open Fwd hatch

FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H2O Flag -  
 Clear In About 4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient  
 Verify:

PLSS/OPS/PGA 3.7 To 4.8 Psig  
 CWEA Status:

Caution  
 PREAMPS

CB(16) COMM: TV - Close

Release PLSS Antenna  
 Lower EV Visor :10

POST ONE-MAN EVA

Perform POST EVA 1 or 2 As Applicable

<p><u>EQUIPMENT PREP EVA 1</u></p> <p>DET-Set/Up :15  Unstow BSLSS, Remove From Bag  Stow BSLSS RH Fwd Cabin  Stow BSLSS Bag In Jett Bag (LHSSC)  Stow RCU Brkt Bag (Purse) In Jett Bag  Stow Jett Bag On LH Fwd Floor</p> <p>Unstow PLSS On Floor, Set Against Hatch  Stow COAS In FWD Window Mount  Secure Util Lts Back Of AOT  Verify 02 EVA Stowage Straps Accessible</p> <p>Empty UCTA's  Check PGA Zippers, Verify Lock-Lock  Fill Drink Bags(Back ISA)-Evac, Install</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">EVA 1 PREP &amp; POST</div>	<p><u>PLSS DONNING</u> :58</p> <p>LMP 1st:  Set PLSS On Mid-Step  Retrieve OPS, Unstow Antenna Lead  Verify OPS Reg Decay, Unstow Nozzle  Secure Flap</p> <p>Attach OPS To PLSS  Connect OPS Antenna Lead To PLSS  Verify Sublimator Exhausts Clear</p> <p>Unstow PLSS Straps &amp; Hoses  Remove Elect Dust Cap, Stow In Purse  Verify DIVERTER, O2, FEEDWATER - OFF  Connect Battery Cable</p>
<p>Stow PGA Gas Conn Plugs In Purse  Empty PGA Pockets Into Purse  Verify Watch On PGA</p> <p>Unstow CSRC (LHSSC), Remove Bag, Stow  In LMP Pkt  Unstow Sur Seq Cam (LHSSC) Install Lens  Stow Sur Seq Camr Bag In Jett Bag  Install Mag CC (Purse)  Connect Power Cable, Ver Ops</p>	<p>Unstow CDR Boots, Purge Valve In Purse  CDR Don Boots  LMP Move To Aft Cabin Area  Unstow LMP Boots, Purge Valve In Purse</p> <p>Stow IV Gloves In Bot Boot Comp  LMP Don Boots  Unstow LMP OPS  Remove Pallet, Stow In Jett Bag</p>	<p>Verify The Following Locked:  OPS To PLSS  OPS Antenna To PLSS  PLSS Battery Connection</p> <p>Don PLSS/OPS, Lift PLSS Hoses Above  LH Lower Strap</p> <p>Connect PLSS O2 Hoses To PGA  Verify DIVERTER, O2, FEEDWATER - OFF  Unstow OPS O2 Hose</p> <p>CDR Repeat <u>PLSS DONNING</u></p>
<p>Settings 2.8/60, TIME FR (2 Places)  Stow Sur Seq Cam In LHSSC,  Handle Aft, Lens Outboard  Unsnap LEC Compt (Aft LHSSC)</p>	<p>Hand LMP OPS To CDR For Checkout  Unstow CDR OPS  Remove Pallet, Stow In Jett Bag  Perform OPS Check (Both)</p> <p>Stow LMP OPS On RH Floor Under Dump Vlv  LMP Move To LMP Station  Stow CDR OPS On LH Eng Cover</p> <p>Apply Antifog (ISA Back Pkt) <i>2 coats</i>  Stow EMU Maint Kit In Purse  Unstow LEVA's  Stow LEVA's, Then Helmets On RH Eng Cov</p>	<p>Unstow RCU's  Connect RCU To PGA Upper Straps  Verify RCU Controls:  PUMP, FAN - OFF (Left) MODE SEL-0</p> <p>Connect RCU To PLSS, Snap OPS O2 Hose  To Side of PLSS</p>
<p>Stow LEVA Bags On Floor, 1 Left, 1 Rt  Position Helmets On Armrests</p> <p>CDR Move To Aft Cabin Area  Deploy LM EVA Antenna  Unstow B&amp;W TV, Stow On Mid-Step  Unstow RCU's, Resnap Flaps  Stow RCU's On Data File</p>	<p>Stow EV Gloves On Comm Panels  Stow LEVA Bags In SRC Area  Disconnect 3 Armrests, CDR LH,  LMP RH &amp; LH, Stow In Jett Bag</p> <p>P06E  CB(11) PGNS: IMU OPR - Open  PRO (Hold In Until STBY Lt - On)  UPDATA LINK - OFF</p> <p>Fwd Hatch Handle - UNLOCK</p>	

PLSS COMM CHECK :18

Verify Powerdown CB Configuration

COMM: MODULATE - FM

CB(16) COMM: TV - Close

Verify Voice Comm With Hou

Audio (CDR)

S-BAND - T/R

ICS - T/R

RELAY - OFF

MODE - VOX (VOX SENS MAX)

VHF A - T/R

VHF B - RCV

Audio (LMP)

S-BAND - T/R

ICS - T/R

RELAY - ON

MODE - VOX (VOX SENS MAX)

VHF A - T/R

VHF B - RCV

COMM:

S-BD XMTR/RCVR-SEC

VHF - VOICE, ON, OFF, ON, OFF, HI

RANGE - RANGE

SQUELCH A & B - Noise Thres + 1-1/2

RECORDER - ON

VHF Antenna - EVA

UPLINK SQUELCH - ENABLE

LMP Connect To PLSS Comm (Audio CB  
Open/Close)

PLSS PTT (LMP) - MAIN (Rt)

PLSS Mode(LMP) - A, Wheel-CCW (Tone-On,  
Vent Flag- P, Press Flag- O, O2 Mom)

PLSS O2 Press Gage > 85%

Perform Comm Check With CDR

**NOTE:** Unstow PLSS Antenna If It  
Transmits Garbled And/Or Loses TM

CDR Connect To PLSS Comm (Audio CB  
Open/Close)

Audio (CDR)

VHF A - OFF

VHF B - OFF

PLSS PTT (CDR) - MAIN (Rt)

**NOTE:** No MSFN Reception In PLSS Mode B

PLSS Mode(CDR) - B, Blade-CCW (Tone-On,  
Vent Flag- P, Press Flag- O, O2 Mom)

PLSS O2 Press Gage > 85%

Perform Comm Check With LMP

PLSS Mode (LMP)- B, Blade-CCW (Tone-On)

PLSS Mode (CDR)- A, Wheel-CCW (Tone-On)

Verify Voice Comm With Each Other

PLSS Mode (Both) - AR (Tone-On)

**NOTE:** (AR) Wheel-Hou, Blade-EVA

Perform Comm & TM Check With Hou &  
Comm Check With Each Other

Read PLSS O2 Qty to Hou

**NOTE:** If Comm Is NO GO With Hou

S-BD MOD - PM

Verify Comm & TM

CB(16) COMM: TV - Open

FINAL SYSTEMS PREP :28

CB(16) ECS: CABIN REPRESS - Close (Ver)

SUIT FAN ΔP - Open

SUIT FAN 2 - Open

SUIT FAN Sel - 2

Verify ECS Caution & H2O SEP COMP

Lts - On (~ 1 Min)

SUIT GAS DIVERTER - PULL-EGRESS  
CABIN GAS RETURN - EGRESS  
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT :29

LMP 1st - Unstow OPS O2 Actuator  
Connect Actuator To RCU

SUIT ISOL - SUIT DISC

Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B  
Retrieve Purge Valve (Purse)-

Verify Closed, Locked & LO  
Install Purge Valve In PGA R/R  
PGA Diverter Valves - Vertical

CDR Repeat OPS CONNECT

Drink

DES H2O VLV - CLOSE

HELMET/GLOVE DONNING :38

Position Mikes (Both)

PLSS FAN - ON, Rt (Vent Flag - Clear)

Don Helmets, Check Drink Bag Position

Don LEVA's

LCG - Cold, As Req'd

CB(16) ECS: LCG PUMP - Open

Disconnect LM H2O Hose

Connect PLSS H2O Hose

Stow LM Hoses (CDR's To ECS Handhold)

Verify The Following:

Helmet & Visor (2) - Aligned &  
Adjusted

Torso Tiedown (2) - Adjusted

O2 Connectors (6) - Locked

Purge Valves (2) - Locked

H2O Connectors (2) - Locked

Comm Connectors(2) - Locked

Verify EVA CB Configuration  
Verify No Fog RH Window  
Tie Jett Bag, Transfer to Eng Cover

Don EV Gloves & Verify:  
Wrist Locks (4) - Locked  
Glove Straps (4) - Adjusted

**NOTE:** If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)  
PLSS PUMP - ON, Rt

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK :52

PLSS O2 - ON (Tone-On, O2 Flag-0)  
Press Flag Clear (3.1-3.4 Psid)  
Cuff Gage 3.7-4.0 Psig  
O2 Flag Clear

PLSS O2 - OFF (Cuff Gage Decay <.3  
Psig In 1 Min)  
PLSS O2 - ON (Cuff Gage 3.7-4.0  
Psig, Tone & O2 Flag May Come On)

CABIN DEPRESS :57

Confirm Go For Depress From Hou  
CB(16)ECS: CABIN REPRESS - Open  
CABIN REPRESS Vlv - CLOSE

Ovhd Or Fwd Dump Vlv - OPEN Then AUTO @  
3.5 Psia (Verify Cuff Gage Does  
Not Drop Below 4.8 Psig)

Verify:  
Cabin At 3.5 Psia  
LM Suit Circuit 3.6 To 4.3 Psia  
PGA > 4.8 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN  
Verify:  
Tone-On & H2O Flag - A (1.2-1.7 Psia)  
PGA > 4.8 Psig & Decaying

Partially Open Fwd Hatch

FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H2O Flag -  
Clear In About 4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient

Verify:  
PGA 3.7 To 4.8 Psig  
CWEA Status:  
Caution  
PREAMPS  
ECS

H2O SEP COMP Lt - ON

Lighting: ANUN/NUM - DIM  
DET - STOP

Release PLSS Antennas  
Lower EV Visor :10

POST EVA 1

PLSS FEEDWATER - CLOSE  
Fwd Hatch - Close & Lock  
Dump Valves (Both) - AUTO

**NOTE:** PLSS O2 & PRESS Flags May Come  
On During Repress. If PLSS O2 <10%  
Manually Control Cabin Repress To  
Maintain Positive PGA Pressure.  
(Leave Cabin Repress CB Open For  
Manual Repress)

Lighting: ANUN/NUM - BRIGHT

CABIN REPRESS - AUTO  
CB(16)ECS: CABIN REPRESS - Close  
MASTER ALARM & CABIN Warning Lt - On  
Verify Cabin Press Increasing  
PRESS REG A & B - CABIN

PLSS O2 - OFF @ Cabin > 2.5 Psia

CABIN Warning Lt - Off  
Verify Cabin Press Stable At 4.6-5 Psia  
Use Purge Valve To Depress PGA As Req'd  
DET - Set/Up :00

POST EVA SYSTEMS CONFIGURATION :00

CABIN GAS RETURN - AUTO  
SUIT CIRCUIT RELIEF - AUTO (Verify)  
SUIT GAS DIVERTER - PUSH-CABIN

Verify EVA CB Configuration  
CB(16) ECS: SUIT FAN 2 - Close  
SUIT FAN ΔP- Close  
ECS Caution & H2O SEP Comp Lts - Out

Doff Gloves, Stow On Comm Panels  
Doff Helmets With Visors, Stow On  
RH Eng Cover, Top ETB

Verify Safety On Dump Valve  
DES H2O Vlv - OPEN  
Remove Purge Valve, Stow In Purse  
Discon OPS O2 Hose

Connect LM O2 Hoses

SUIT ISOL (Both) - SUIT FLOW  
PLSS PUMP - OFF (Left)  
PLSS FAN - OFF (Left)

<p>Disconnect PLSS ...0 From PGA Connect LM H2O CB(16) ECS: LCG PUMP - Close Adjust LCG Cooling Gradually</p> <p>PLSS Mode (Both) - 0 Connect To LM Conn(Audio CB, Biomed Sw)</p> <p>AUDIO (CDR &amp; LMP) VHF A - RCV VHF B - OFF MODE - ICS/PTT RELAY - OFF</p> <p>COMM: S-BD XMTR/RCVR - PRIM VHF - OFF, ON, OFF, OFF, LEFT, HI RECORDER - OFF UPLINK SQUELCH-OFF</p>	<p><u>PLSS/OPS DOFFING</u> :16</p> <p>Disconnect OPS, Actuator From RCU's Disconnect RCU's From PGA Verify Pump, Fan, Mode Sel-Off Discon RCU's From PLSS, Stow On Mid-Step</p> <p>Disconnect PLSS O2 Hoses Doff PLSS/OPS (LMP 1st) Stow OPS O2 Hose, Actuator, &amp; Antenna Blade; Leave Flaps Open For Checkout Stow LMP PLSS On Floor Stow CDR PLSS On Mid-Step</p>	<p><u>POST EVA CABIN CONFIGURATION</u> :43</p> <p>Stow CSRC (Mid-Step) In ISA Top Pkt Unstow Scale (Bot LHSSC)</p> <p>Empty ETB As Follows: Weigh Sample Bag, Report To Hou, Stow Bag In LHSSC Replace 70mm Camr Mag With B&amp;W LL, MM Stow 3-16mm Mags In RHSSC Stow Map As Reqd Stow Return Items In ISA Back Pkt Stow Lens/Scribe/Brush In ISA Back Pkt</p>
<p><u>PLSS O2 RECHARGE</u> :10</p> <p>Verify DES O2 &gt;38%</p> <p>Connect LM O2 To PLSS (LMP's 1st) PLSS FILL - OPEN Then CLOSE After 2 Min</p> <p>PLSS Mode - AR (O2 QTY ~85%) PLSS Mode - 0</p> <p>Repeat O2 Recharge For CDR PLSS</p> <p>Stow O2 Supply Hose</p>	<p>Unstow Disp Cont (LHSSC), Set On LH Fwd Floor Install Gas Conn Plugs (Purse) In PGA</p> <p><b>CAUTION:</b> Insure PLSS LiOH Carts &amp; Batts Numbered 1 &amp; 2 Replaced With 3 Or 4</p>	<p>Stow In ETB: BSLSS 2-70mm Camrs With B&amp;W Mags 1-B&amp;W Mag KK Polarizing Filter (RHSSC) 3-16mm Mags FF, GG, HH EVA 2 Map</p> <p>Unstow Jett Bag (LHSSC) Place ETB Inside Jett Bag, Stow On RH Cabin Floor, Fwd</p> <p>Weigh SRC, Report To Hou CDR Move To Aft Cabin Stow SRC In Lower Comp</p>
	<p>CDR 1st: Change PLSS Batt, Stow In Disp Cont Connect Cable To Battery Stow PLSS Hoses &amp; Straps Change LiOH Cart, Temp&lt;130°-Read Decals</p> <p>Disconnect OPS Antenna Connector Remove OPS &amp; Stow Antenna Connector Verify OPS O2 Press 5380 - 6380 Stow CDR OPS On LH Eng Cover, End Up Stow CDR PLSS In Recharge Station</p> <p>Stow LMP PLSS On Mid-Step, Repeat Above</p>	<p>Stow CDR OPS In Top Comp Stow Scale In Purse</p> <p>Verify Powerdown CB Configuration MODULATE - PM</p> <p>Unstow Lunar Surface Checklist, 4-4 Stow EVA 1 Prep &amp; Post Card</p>
	<p>Stow LMP OPS On Floor Under Dump Vlv Stow PLSS On Floor Against Hatch</p> <p>Stow RCU's On Data File Stow Disp Cont On Mid-Step Under PLSS</p>	



## EQUIPMENT PREP EVA 2

DET-Set/Up :30  
Empty UCTA's  
Check PGA Zippers, Verify Lock-Lock  
Fill Drink Bags, Evac, Install

Stow Gas Connector Plugs In Purse  
Empty PGA Pockets Into Purse  
Verify Watch, On PGA  
CDR Move To Aft Cabin

CDR Don Boots  
Unstow CDR OPS  
Perform OPS Check (Both)  
Stow Both OPS On Floor

Remove ETB From Jett Bag, Stow In LHSSC  
Verify Eqpt In ETB:  
2-70mm Camrs With B&W Mags LL, MM  
Polarizing Filter  
1-Spare B&W Mag KK  
3-16mm Mags FF, GG, HH  
EVA 2 Map  
BSLSS  
Stow ETB On Mid-Step

LMP Don Boots  
Unstow PLSS Condensate Container, Stow  
On Rock Box

Apply Antifog (Purse) *2 coats*  
Stow Visors & Helmets On RH Eng Cover  
Tie Disp Cont, Stow On LH Eng Cover  
FWD Hatch Handle - UNLOCK

PLSS DONNING :57

LMP 1st:  
Set PLSS On Mid-Step  
Retrieve OPS, Unstow Antenna Lead  
Verify OPS Reg Decay, Unstow Nozzle  
Secure Flap

## EVA 2 PREP &amp; POST

Attach OPS To PLSS  
Connect Antenna Lead To PLSS  
Verify Sublimator Exhausts Clear

Unstow PLSS Straps & Hoses  
Verify DIVERTER, O2, FEEDWATER - OFF  
Verify The Following Locked:  
OPS To PLSS  
OPS Antenna To PLSS  
PLSS Battery Connection

Don PLSS/OPS, Lift PLSS Hoses Above  
LH Lower Strap

Connect PLSS O2 Hoses To PGA  
Verify DIVERTER, O2, FEEDWATER - OFF  
Unstow OPS O2 Hose

CDR Repeat PLSS DONNING

Unstow RCU's  
Connect RCU To PGA Upper Straps  
Verify RCU Controls:  
PUMP, FAN - OFF (Left) MODE SEL - 0

Connect RCU To PLSS, Snap OPS O2 Hose  
To Side Of PLSS

PLSS COMM CHECK :17

Verify Powerdown CB Configuration  
COMM: MODULATE - FM  
CB(16) COMM: TV - Close (Verify)  
Verify Voice Comm With Hou

Audio (CDR)  
S-BAND - T/R  
ICS - T/R  
RELAY - OFF  
MODE - VOX (VOX SENS MAX)  
VHF A - T/R  
VHF B - RCV

Audio (LMP)  
S-BAND - T/R  
ICS - T/R  
RELAY - ON  
MODE - VOX (VOX SENS MAX)  
VHF A - T/R  
VHF B - RCV

COMM:  
S-BD XMTR/RCVR - SEC  
VHF - VOICE, ON, OFF, ON, OFF, HI  
RANGE - RANGE  
SQUELCH A & B - Noise Thres + 1-1/2  
RECORDER - ON  
VHF Antenna - EVA  
UPLINK SQUELCH - ENABLE

LMP Connect To PLSS Comm (Audio CB  
Open/Close)

PLSS PTT (LMP) - MAIN (Rt)  
PLSS Mode(LMP) - A, Wheel-CCW (Tone-On,  
Vent Flag- P, Press Flag- O, O2 Mom)  
PLSS O2 Press Gage >85%  
Perform Comm Check With CDR

**NOTE:** Unstow PLSS Antenna If It  
Transmits Garbled And/Or Loses TM

CDR Connect To PLSS Comm (Audio CB  
Open/Close)

Audio (CDR)  
VHF A - OFF  
VHF B - OFF  
PLSS PTT(CDR) - MAIN (Rt)

<p><b>NOTE:</b> No MSFN Reception In PLSS Mode B</p> <p>PLSS Mode(CDR) - B, Blade-CCW (Tone-On, Vent Flag - P, Press Flag- O, O2 Mom) PLSS O2 Press Gage &gt;85% Perform Comm Check With LMP</p> <p>PLSS Mode (LMP)- B, Blade-CCW (Tone-On) PLSS Mode (CDR)- A, Wheel-CCW (Tone-On) Verify Voice Comm With Each Other</p> <p>PLSS Mode (Both) - AR (Tone-On)</p>	<p>Connect OPS O2 Hose To P6.. B/B Retrieve Purge Valve (Purse) - Verify Closed, Locked &amp; LO Install Purge Valve In PGA R/R PGA Diverter Valves - Vertical</p> <p>CDR Repeat <u>OPS CONNECT</u></p>	<p>Don EV Gloves &amp; Verify: Wrist Locks (4) - Locked Glove Straps (4) - Adjusted</p> <p><b>NOTE:</b> If PGA Biting, PLSS O2 - ON/OFF</p> <p>PLSS DIVERTER - MIN (Verify) PLSS PUMP - ON, Rt</p> <p>PRESS REG A &amp; B - EGRESS</p>
<p><b>NOTE:</b> (AR) Wheel-Hou, Blade-EVA</p> <p>Perform Comm &amp; TM Check With Hou &amp; Comm Check With Each Other Read PLSS O2 Qty To Hou</p> <p><b>NOTE:</b> If Comm Is NO GO With Hou S-BD MOD - PM Verify COMM &amp; TM</p>	<p>Verify Items Prepared For Jettison: ECS LiOH Cartridge &amp; Brkt Hammocks PLSS Batteries &amp; LiOH Carts Food Waste, Urine Bags Feedwater Bags &amp; Scale</p> <p>Drink DES H2O VLV - CLOSE</p> <p><u>HELMET/GLOVE DONNING</u> :37</p> <p>Position Mikes (Both) PLSS FAN - ON, Rt (Vent Flag - Clear) Don Helmets With LEVA's, Check Drink Bag Position</p>	<p><u>PRESSURE INTEGRITY CHECK</u> :52</p> <p>PLSS O2 - ON (Tone-On, O2 Flag - O) Press Flag Clear (3.1-3.4 Psid) Cuff Gage 3.7-4.0 Psig O2 Flag Clear</p> <p>PLSS O2 - OFF (Cuff Gage Decay &lt;.3 Psig In 1 Min) PLSS O2 - ON (Cuff Gage 3.7-4.0 Psig, Tone &amp; O2 Flag May Come On)</p> <p><u>CABIN DEPRESS</u> :57</p>
<p><u>FINAL SYSTEMS PREP</u> :27</p> <p>CB(16) ECS: CABIN REPRESS - Close (Ver) SUIT FAN ΔP - Open SUIT FAN 2 - Open Verify ECS Caution &amp; H2O SEP COMP Lts - On (~1 Min)</p> <p>SUIT GAS DIVERTER - PULL-EGRESS CABIN GAS RETURN - EGRESS SUIT CIRCUIT RELIEF - AUTO (Verify)</p>	<p>LCG - COLD, As Reqd CB(16) ECS: LCG PUMP - Open Disconnect LM H2O Hose Connect PLSS H2O Hose Stow LM Hoses (CDR's To ECS Handhold)</p> <p>Verify The Following: Helmet &amp; Visor (2) - Aligned &amp; Adjusted</p> <p>Torso Tiedown (2) - Adjusted O2 Connectors (6) - Locked Purge Valves (2) - Locked H2O Connectors (2) - Locked Comm Connectors (2) - Locked</p>	<p>Confirm Go For Depress From Hou CM(16)ECS: CABIN REPRESS - Open CABIN REPRESS VLV - CLOSE</p> <p>Ovhd Or Fwd Dump Vlv - OPEN Then AUTO @ 3.5 Psia (Verify Cuff Gage Does Not Drop Below 4.8 Psig) Verify: Cabin At 3.5 Psia LM Suit Circuit 3.6 To 4.3 Psia PGA &gt; 4.8 Psig &amp; Decaying</p>
<p><u>OPS CONNECT</u> :28</p> <p>LMP 1st - Unstow OPS O2 Actuator Connect Actuator To RCU SUIT ISOL - SUIT DISC Discon LM O2 Hoses, Secure About PGA</p>	<p>Verify EVA CB Configuration</p>	<p>Start Wrist Watch :00</p> <p>Ovhd Or Fwd Dump Valve - OPEN Verify: Tone-On &amp; H2O Flag - A (1.2-1.7 Psia) PGA &gt; 4.8 Psig &amp; Decaying Partially Open Fwd Hatch</p>

<p><u>FINAL PREP FOR EGRESS</u> :03</p> <p>PLSS FEEDWATER - OPEN (H2O Flag - Clear In 2-4 Min)</p> <p>Fwd Hatch - Open</p> <p>Rest Until Cooling Sufficient</p> <p>Verify:</p> <p>PGA 3.7 To 4.8 Psig</p> <p>CWEA Status:</p> <p><u>Caution</u></p> <p><u>PREAMPS</u></p> <p>ECS</p> <p>H2O SEP COMP Lt - ON</p> <p>Lighting: ANUN/NUM - DIM</p> <p>DET - STOP</p> <p>Release PLSS Antennas</p> <p>Lower EV Visor :10</p>	<p>PLSS 02 - OFF @ Cabin &gt; 2.5 Psia</p> <p>CABIN Warning Lt - Off</p> <p>Verify Cabin Press Stable At 4.6-5 Psia</p> <p>Use Purge Valve To Depress PGA As Req'd</p> <p>DET - Set/Up :00</p> <p><u>POST EVA SYSTEMS CONFIGURATION</u> :00</p> <p>Verify EVA CB Configuration</p> <p>CB(16) ECS: SUIT FAN 2 - Close</p> <p>SUIT FAN ΔP - Close</p> <p>ECS Caution &amp; H2O SEP Comp Lts - Out</p> <p>Doff Gloves, Stow On Comm Panels</p> <p>Verify Safety On Dump Valve</p> <p>DES H2O VLV - OPEN</p>	<p><u>PLSS/OPS DOFFING</u> :10</p> <p>Disconnect OPS Actuator From RCU's</p> <p>Disconnect RCU's From PGA</p> <p>Verify Pump, Fan, Mode Sel - Off</p> <p>Disconn RCU's From PLSS, Stow On Mid-Step</p> <p>Disconnect PLSS 02 Hoses</p> <p>Doff PLSS/OPS (LMP 1st)</p> <p>Stow OPS 02 Hose, Actuator &amp; Antenna</p> <p>Blade - Leave Flaps Open For Checkout</p> <p>Stow LMP PLSS On Floor</p> <p>Stow CDR PLSS On Mid-Step</p> <p>Unstow Disp Cont(LHSSC), Set On LH Fwd Floor</p> <p>Install Gas Conn Plugs (Purse) In PGA</p>
<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;"> <p>POST EVA 2</p> </div> <p>PLSS FEEDWATER - CLOSE</p> <p>Fwd Hatch - Close &amp; Lock</p> <p>Dump Valves (Both) - AUTO</p> <p><u>NOTE:</u> PLSS 02 &amp; PRESS Flags May Come On During Repress. If PLSS 02 &lt;10% Manually Control Cabin Repress To Maintain Positive PGA Pressure. (Leave Cabin Repress CB Open For Manual Repress)</p> <p>Lighting: ANUN/NUM - BRIGHT</p> <p>CABIN REPRESS - AUTO</p> <p>CB(16)ECS: CABIN REPRESS - Close</p> <p>MASTER ALARM &amp; CABIN Warning Lt - On</p> <p>Verify Cabin Press Increasing</p> <p>PLSS 02 A &amp; B - CABIN</p>	<p>Remove Purge Valves, Stow In Purse</p> <p>Discon OPS 02 Hose</p> <p>Connect LM 02 Hoses, R/R &amp; B/B</p> <p>SUIT ISOL (Both) - SUIT FLOW</p> <p>PLSS PUMP - OFF (Left)</p> <p>PLSS FAN - OFF (Left)</p> <p>Disconnect PLSS H2O From PGA</p> <p>Connect LM H2O To PGA</p> <p>CB(16) ECS: LCG PUMP - Close</p>	<p>CDR 1st:</p> <p>Disconnect OPS Antenna Connector</p> <p>Remove OPS, Stow Antenna Connector</p> <p>Perform OPS Checkout</p> <p>Stow OPS On Engine Cover, Top ETB</p> <p>Stow PLSS Hoses &amp; Upper Straps</p> <p>Remove Lower PLSS Straps, Clip Straps Together, D-Ring (Name-To-Name)</p> <p>Remove Yo-Yo, Stow In Disp Cont</p> <p>Stow Straps In RHSSC (FECAL EMESIS)</p> <p>Stow PLSS On Floor</p> <p>LMP Stow PLSS On Mid-Step, Repeat Above</p>
	<p>PLSS Mode (Both) - 0</p> <p>Connect To LM Comm(Audio CB, Biomed Sw)</p> <p>AUDIO (CDR &amp; LMP)</p> <p>VHF A - OFF</p> <p>VHF B - OFF</p> <p>MODE - ICS/PTT</p> <p>RELAY - OFF</p> <p>COMM:</p> <p>S-BD XMTR/RCVR - PRIM</p> <p>VHF - OFF, OFF, OFF, OFF, LEFT, HI</p> <p>RECORDER - OFF</p>	<p>Verify Powerdown CB Configuration</p> <p>CB(11) HEATERS: RR OPR - Close</p> <p>RR STBY - Open</p>

<p><u>PREP FOR EQUIPMENT JETTISON</u> :26</p> <p>Verify DES O2 QTY &gt; 20%</p> <p>Fwd Hatch Handle - UNLOCK</p> <p>Doff Lunar Boots, Stow In Disp Cont Stow RCU's In Disp Cont Unstow PLSS Condensate Container, Stow In Disp Cont</p>	<p><u>CABIN DEPRESS FOR JETTISON</u> :41</p> <p>CB(16)ECS: CABIN REPRESS - Open Ovhd Or Fwd Dump Valve - OPEN Then AUTO At 3.5 Psia (Verify Cabin Press 3.5 Psia &amp; LM Suit Circuit 3.6 To 4.3 Psia &amp; Decaying)</p> <p>Ovhd Or Fwd Dump Vlv - OPEN (Verify LM Suit Circuit 3.6 To 4.3 Psia)</p>	<p><u>CABIN REPRESS</u> :48</p> <p>Dump Valves(Both)- AUTO (Verify) CABIN REPRESS - AUTO (Verify)</p> <p>CB(16)ECS: CABIN REPRESS - Close MASTER ALARM &amp; CABIN Warning Lt - On Verify Cabin Press Increasing PRESS REG A &amp; B - CABIN</p> <p>CABIN Warning Lt - Off Verify Cabin Press Stable At 4.6-5 Psia</p>
<p>Remove Armrest, Stow In Disp Cont Tie Disp Cont Position PLSS's For Jettison, Eng Cover &amp; Mid-Step</p> <p>Clean &amp; Lub Wristings As Reqd PGA Diverter Vlvs - Horizontal Don EV Gloves Check PGA Connectors</p>	<p><u>HATCH OPENING</u> :44</p> <p>Partially Open Fwd Hatch Ovhd Or Fwd Dump Valve - AUTO</p> <p>Fwd Hatch - Full Open</p> <p>Jettison The Following: Disp Cont PLSS On Mid-Step PLSS On Eng Cover</p>	<p>CABIN GAS RETURN - AUTO SUIT GAS DIVERter - PUSH-CABIN</p> <p>Doff Gloves, Stow On Comm Panels Doff Helmets W/Visors, Stow On Eng Cov VHF ANT SEL - AFT Verify Safety On Dump Valve</p> <p>Unstow Lunar Surface Checklist, 7-4 Stow EVA 2 Prep &amp; Post Card</p>
<p><u>PRESS INTEGRITY CHECK</u> :38</p> <p><b>NOTE:</b> LM Suit Circuit Shall Not Be Maintained At Elevated Press &gt;5 Min</p> <p>SUIT GAS DIVERter - PULL-EGRESS (Ver) CABIN GAS RETURN - EGRESS (Verify) SUIT CIRCUIT RELIEF - CLOSE</p> <p>PRESS REG A - EGRESS PRESS REG B - DIRECT O2 Monitor Cuff Gage To 3.7 - 4.0 Psig Then PRESS REG B - EGRESS (Cuff Gage Decay &lt;.3 Psig In 1 Min)</p> <p>SUIT CIRCUIT RELIEF - AUTO (Suit Ckt Press Decays To 4.8 Psia)</p>	<p>Verify Items Clear Of Ascent Stage</p> <p>Fwd Hatch - Close &amp; Lock</p>	